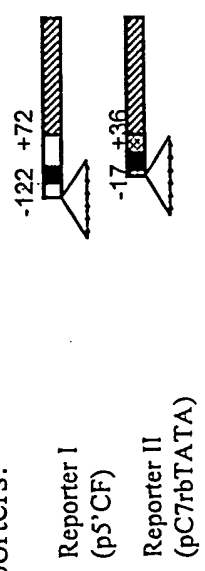


A

Reporters:



Activator (pND3008): 2C7-VP64 (six-finger ZFP)



B

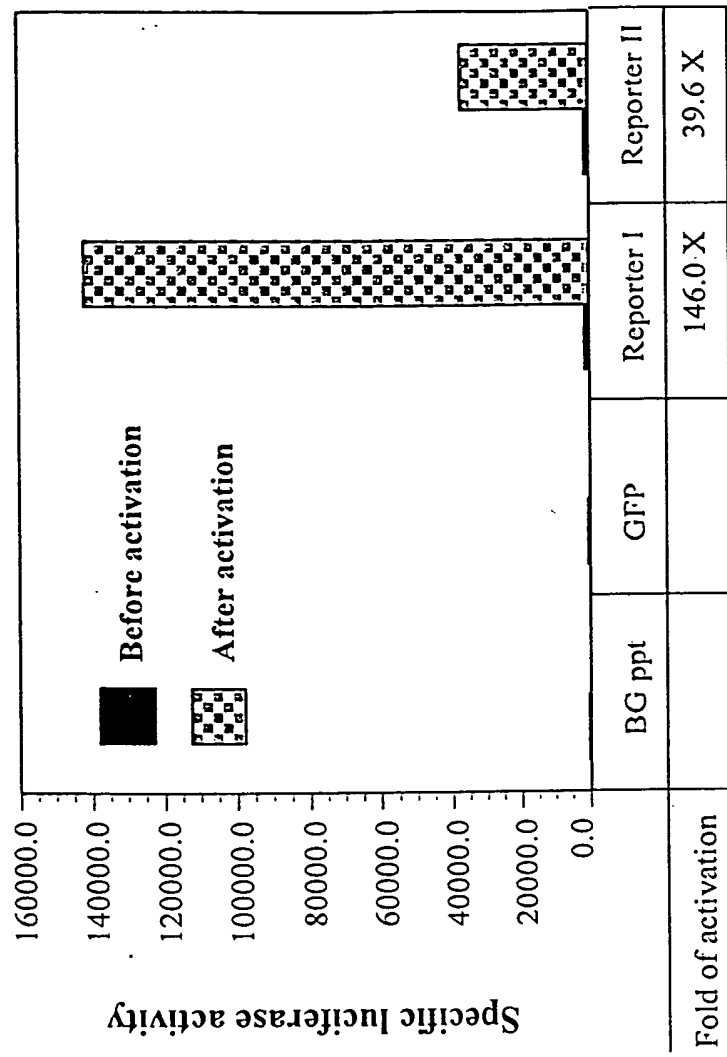


Figure 1

CsVMV Promoter

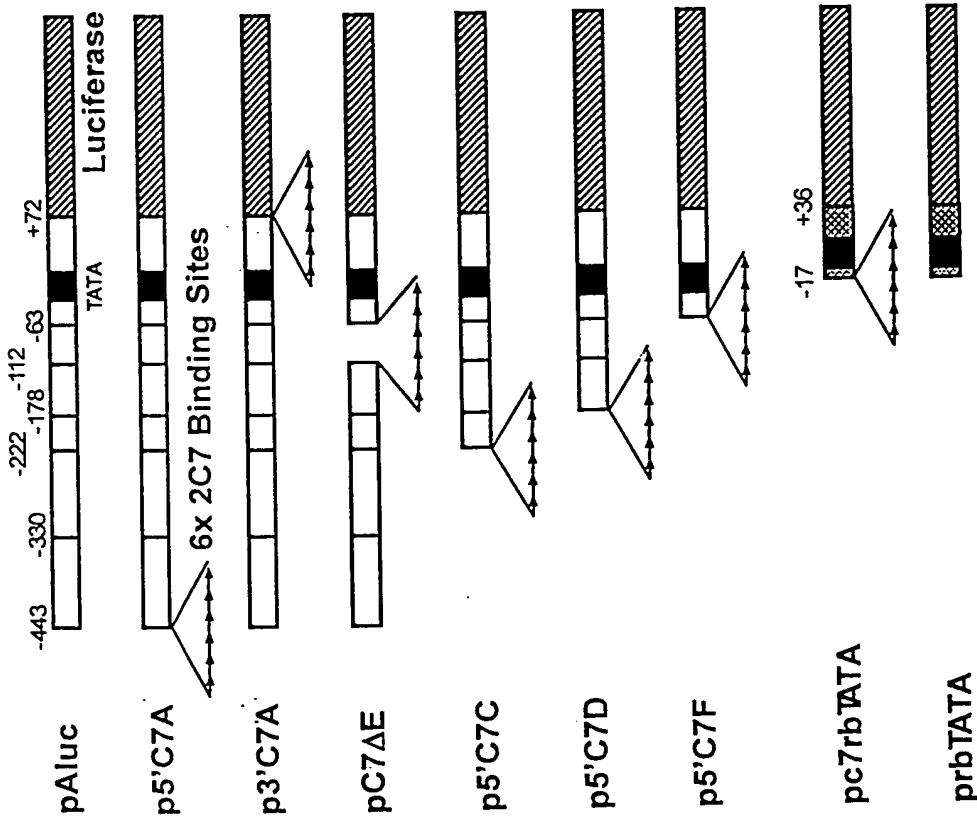


Figure 2

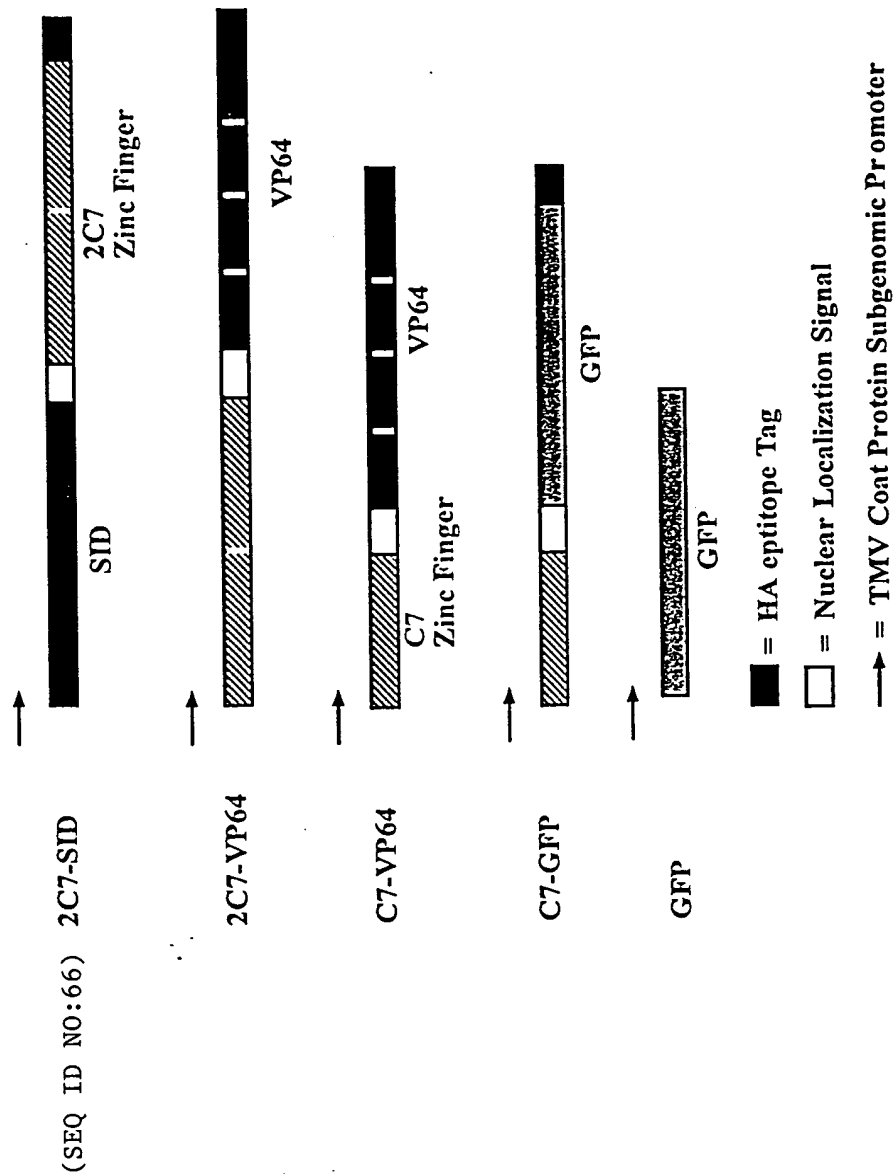


Figure 3

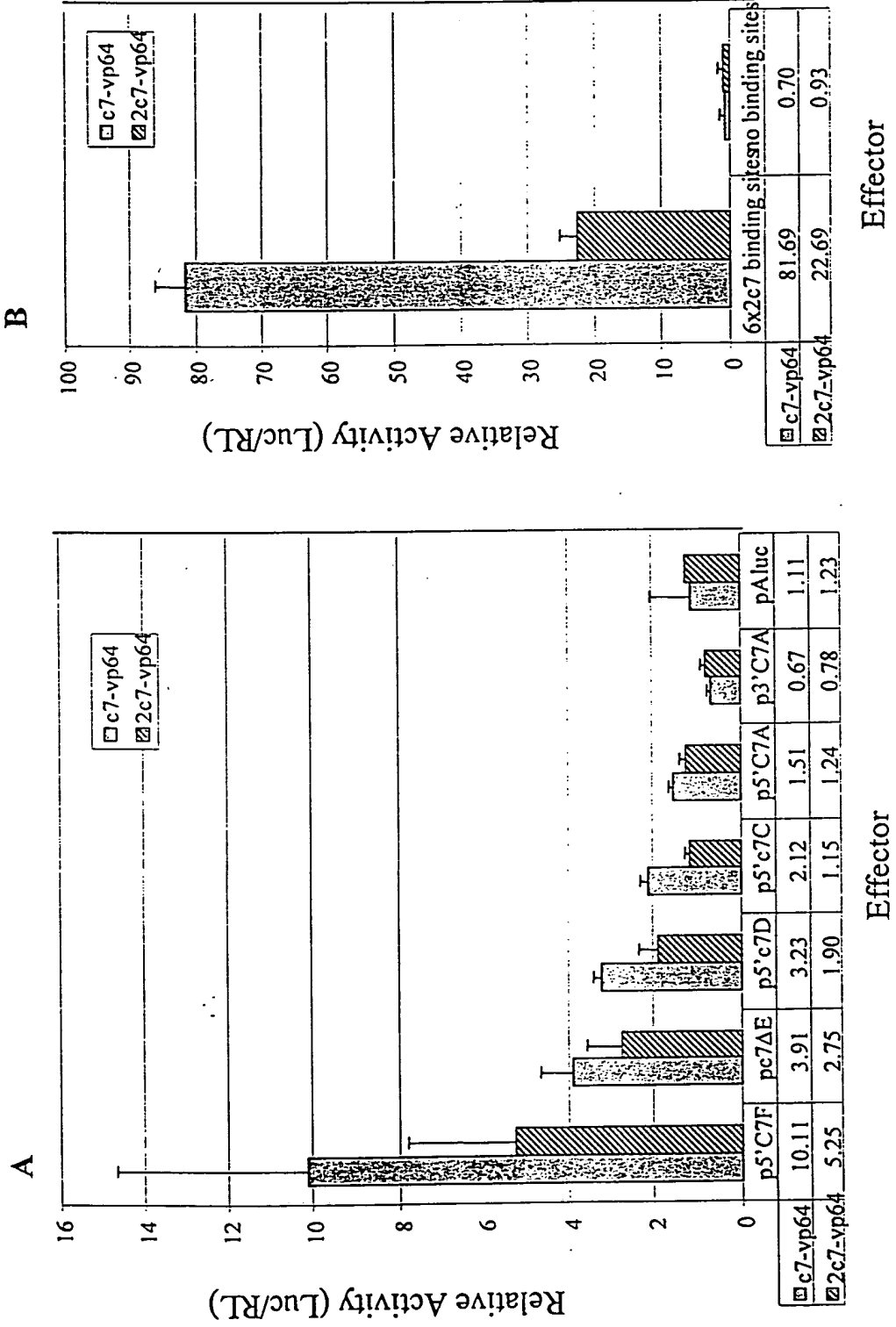


Figure 4

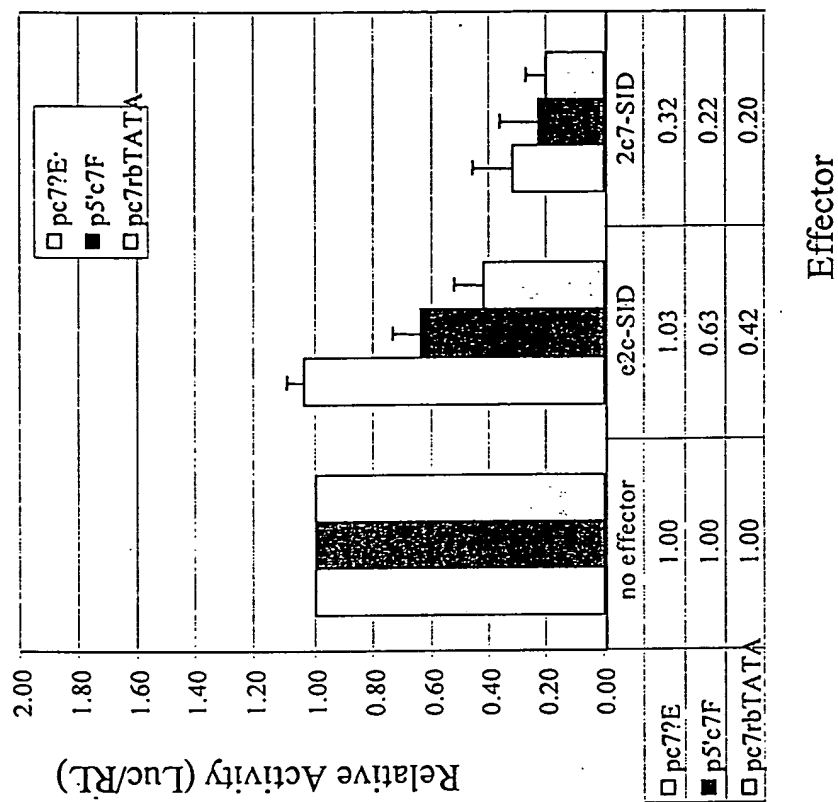


Figure 5

50

1 AQAALPGEKPYACPECGKSFSDPGLVVRHQRTHTGKPYKCECGKSF
AQAALPGEKPYACPECGKSFSSHLVRHQRTHTGKPYKCECGKSF
AQAALPGEKPYACPECGKSFSDPGLVVRHQRTHTGKPYKCECGKSF
AQAALPGEKPYACPECGKSFSSSLVRHQRTHTGKPYKCECGKSF
AQAALPGEKPYACPECGKSFSSSLVRHQRTHTGKPYKCECGKSF

F1

100

51 QRAHLERHQRTHTGKPYKCECGKSFSSNLVRHQRTHTGKPYACPE
QSSNLVRHQRTHTGKPYKCECGKSFSSNLVRHQRTHTGKPYACPE
TSGSLVRHQRTHTGKPYKCECGKSFSSSLVRHQRTHTGKPYACPE
QSSSLVRHQRTHTGKPYKCECGKSFSDCRDLARHQRTHTGKPYACPE
QSSNLVRHQRTHTGKPYKCECGKSFSSNLVRHQRTHTGKPYACPE

F2

F3

150

101 CGKSFSSDLVRHQRTHTGKPYKCECGKSFSSDLVRHQRTHTGK
CGKSFSSDLVRHQRTHTGKPYKCECGKSFSSDLVRHQRTHTGK
CGKSFSSSLVRHQRTHTGKPYKCECGKSFSDCRDLARHQRTHTGK
CGKSFSSSLVRHQRTHTGKPYKCECGKSFSSDLVRHQRTHTGK
CGKSFSSSLVRHQRTHTGKPYKCECGKSFSSSLVRHQRTHTGK

F4

F5

184

151 PYKCECGKSFSSQAGHLASHQRTHTGKKTSGQAG ZFPm1 (SEQ ID NO:38)
PYKCECGKSFSSDLVRHQRTHTGKKTSGQAG ZFPm2 (SEQ ID NO:39)
PYKCECGKSFSSHLVRHQRTHTGKKTSGQAG ZFPm3 (SEQ ID NO:40)
PYKCECGKSFSSHLVRHQRTHTGKKTSGQAG ZFPm4 (SEQ ID NO:41)
PYKCECGKSFSSDLVRHQRTHTGKKTSGQAG ZFPm3 (SEQ ID NO:42)

F6

Figure 6

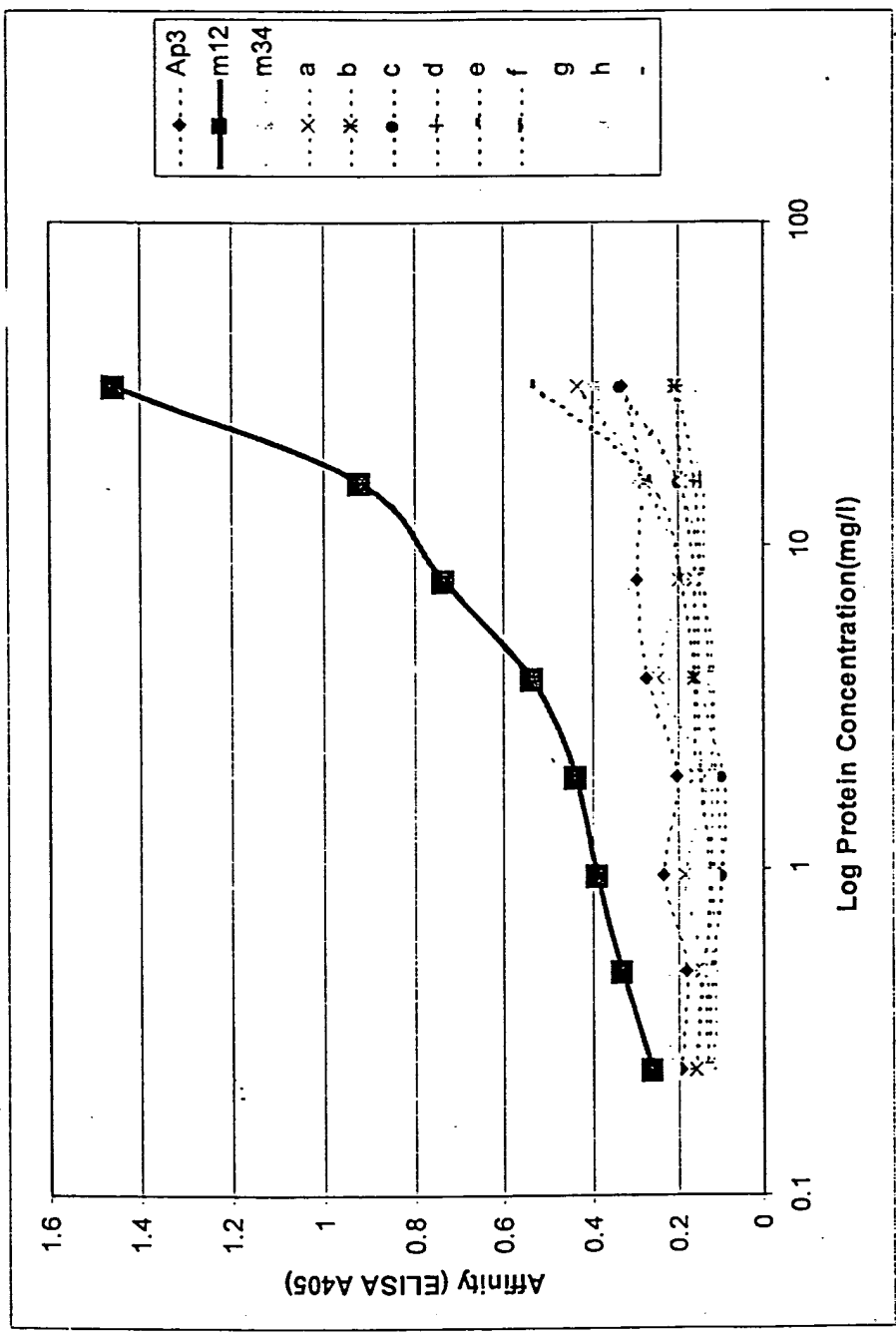


FIGURE 7

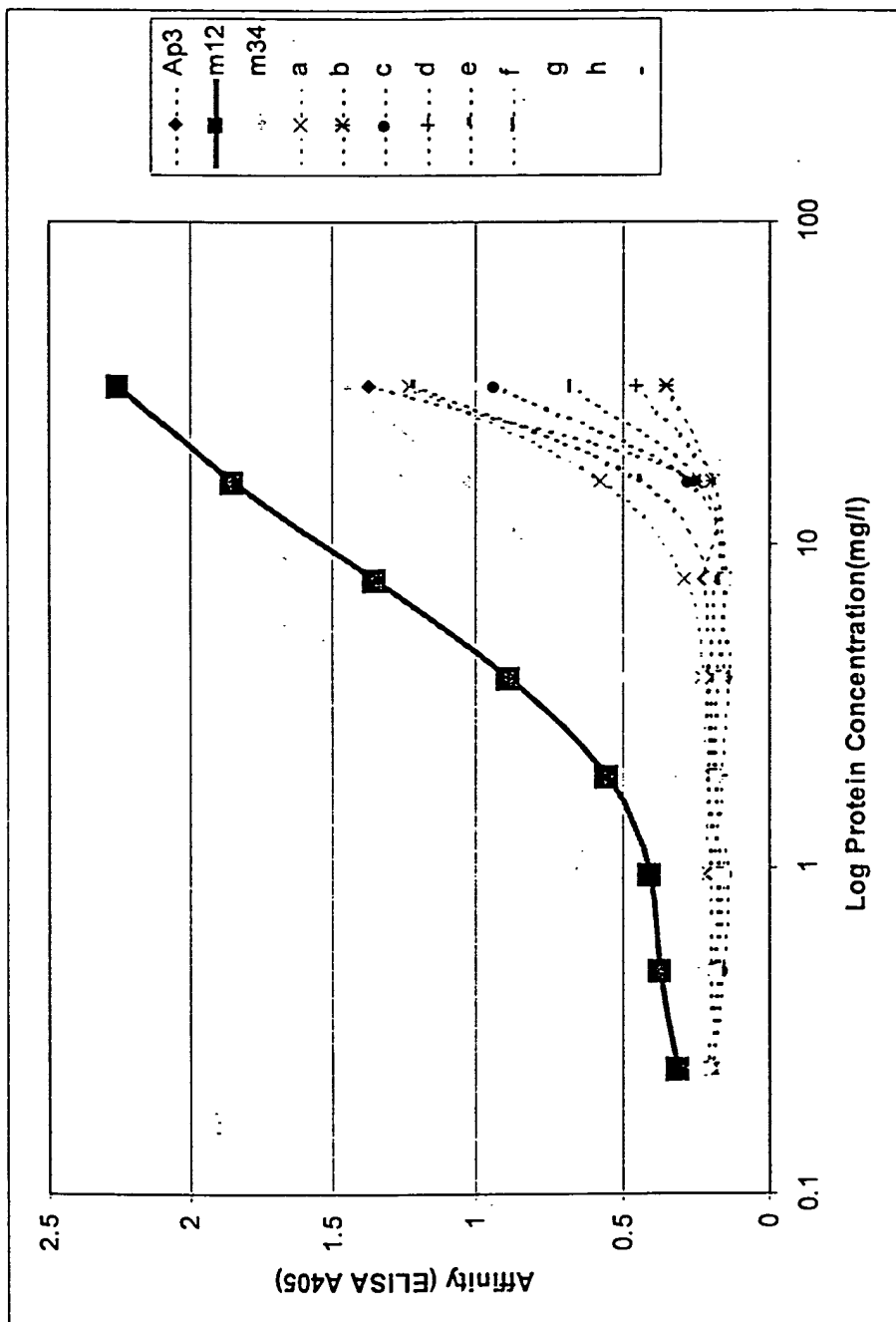


FIGURE 8

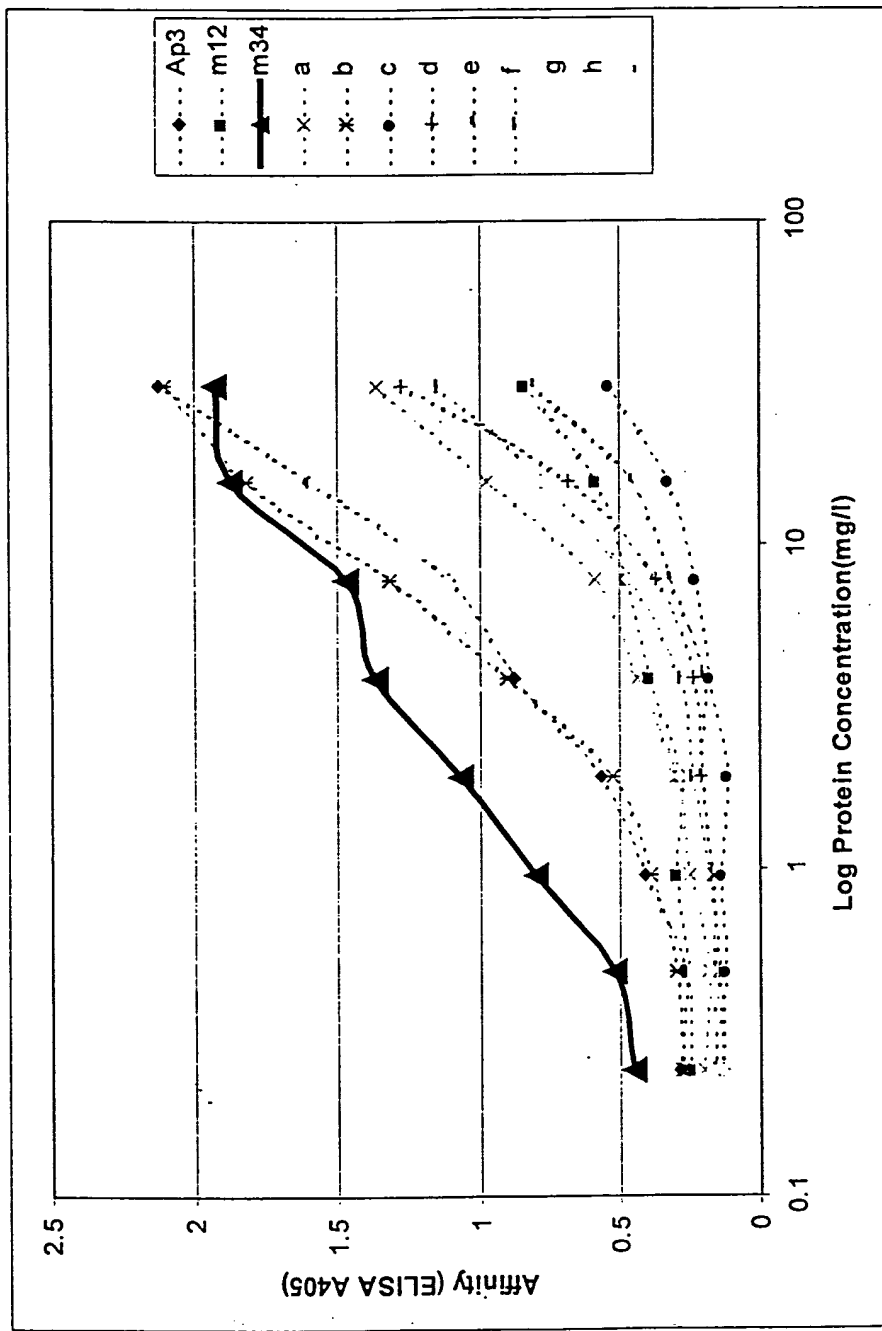


FIGURE 9

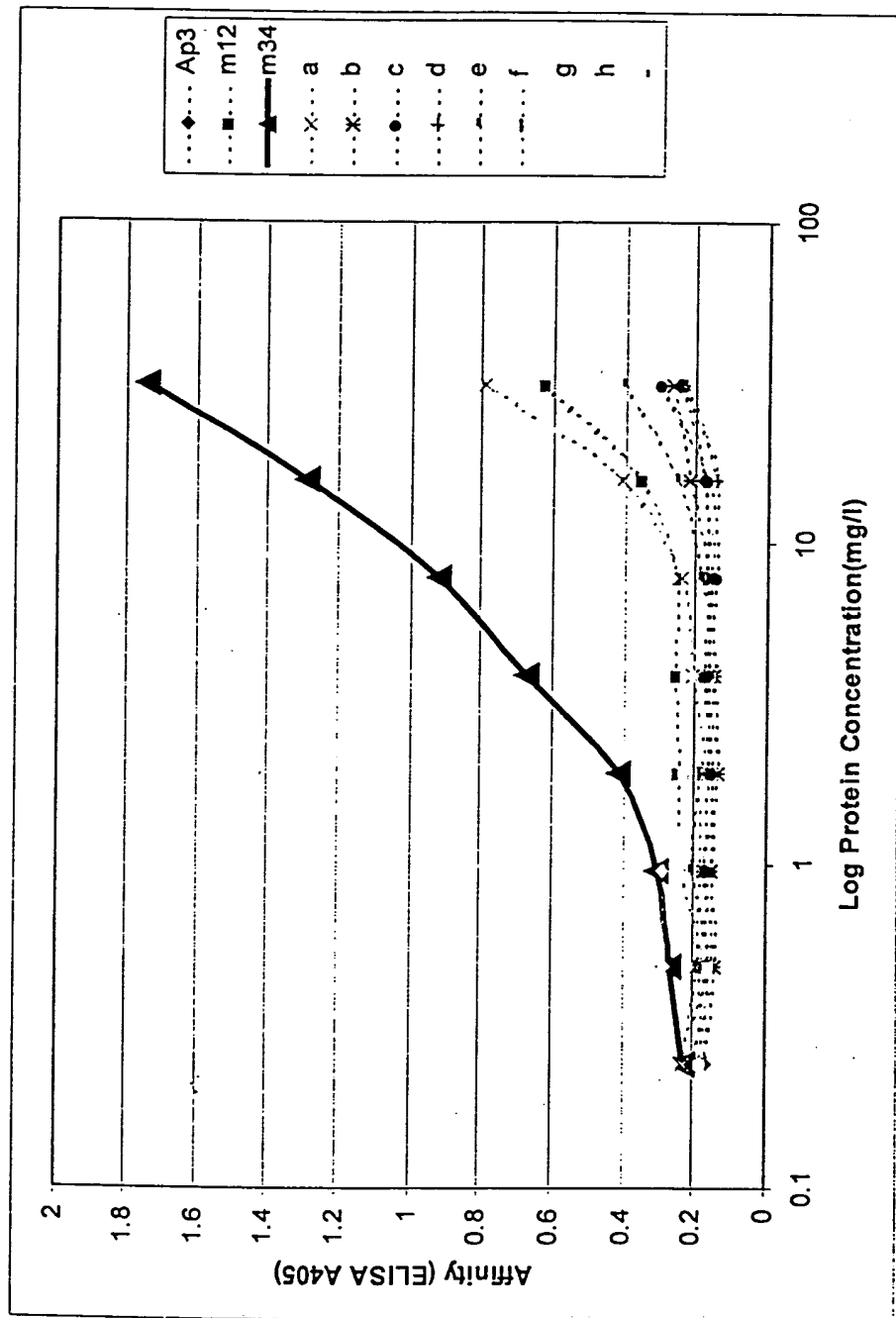


FIGURE 10

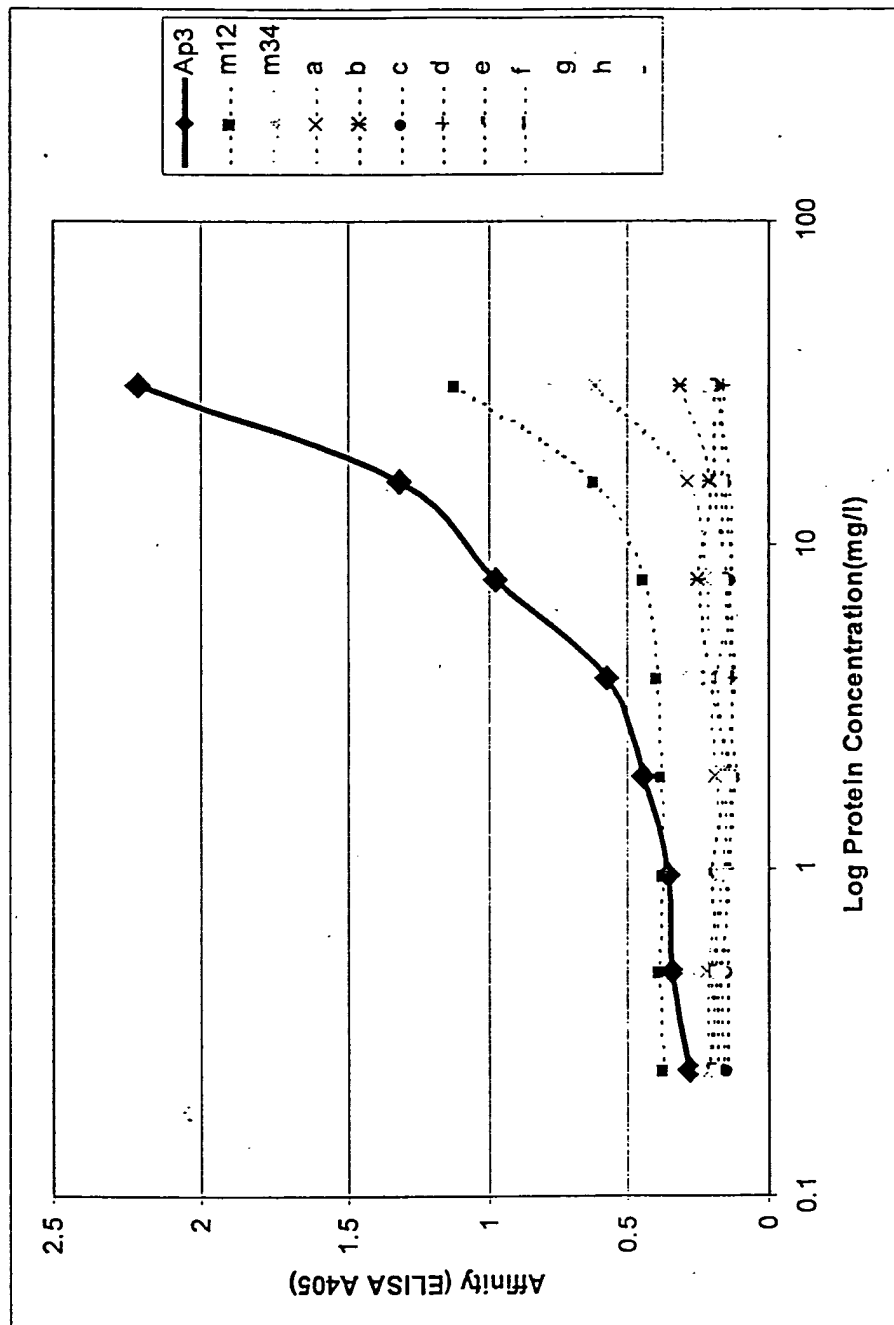
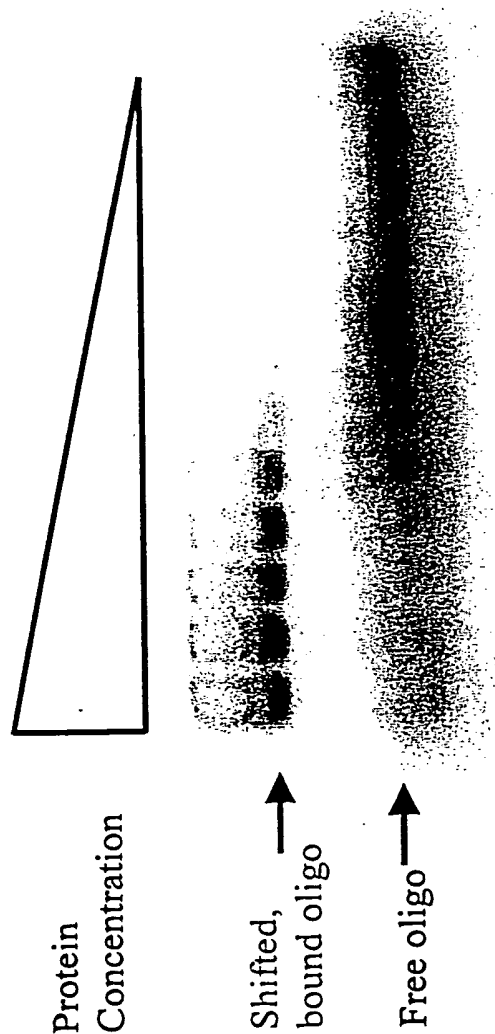


FIGURE 11

A



B

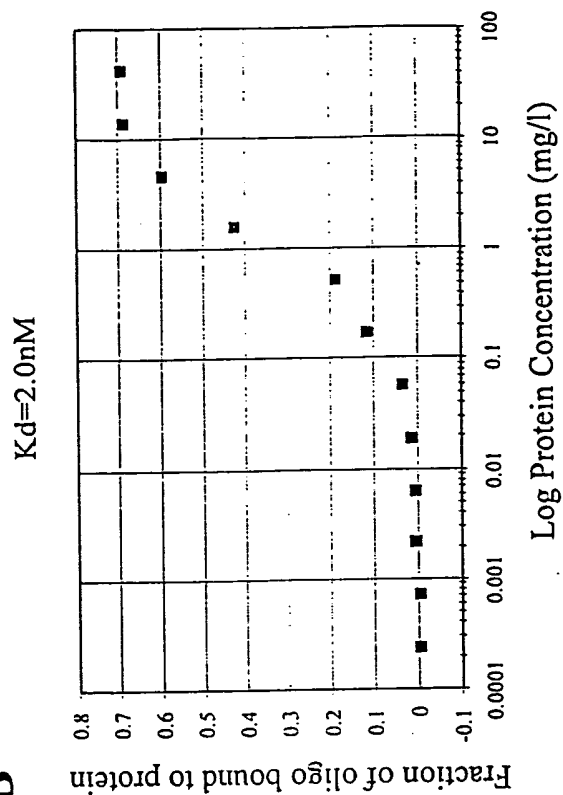


FIGURE 12

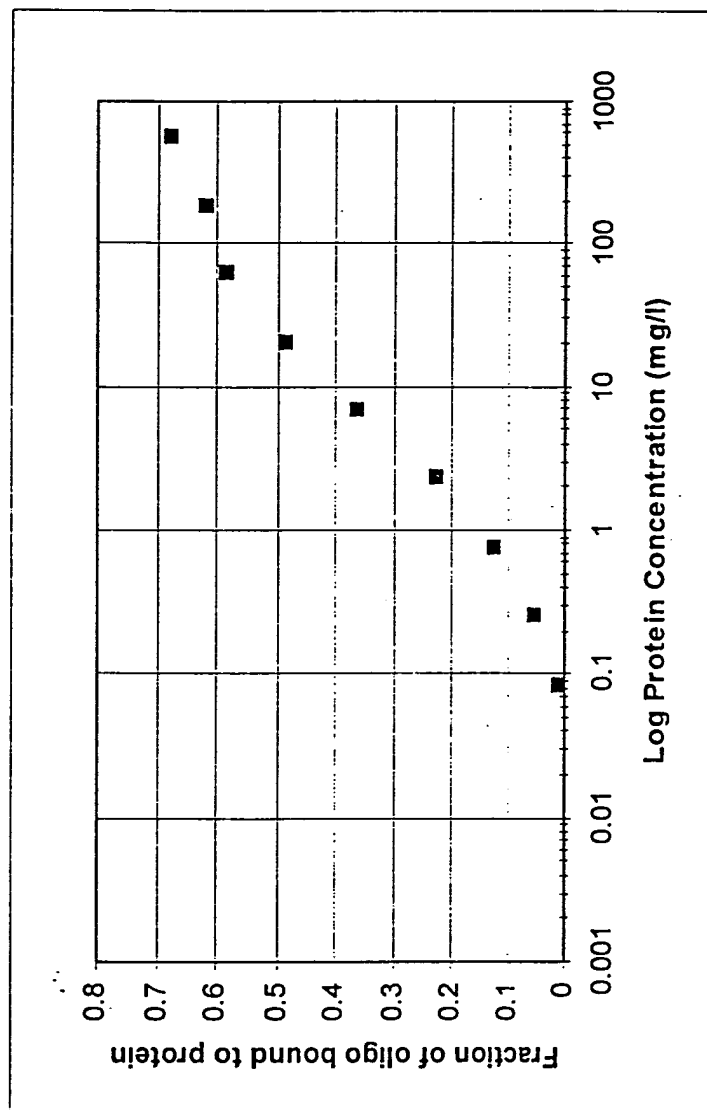


FIGURE 13

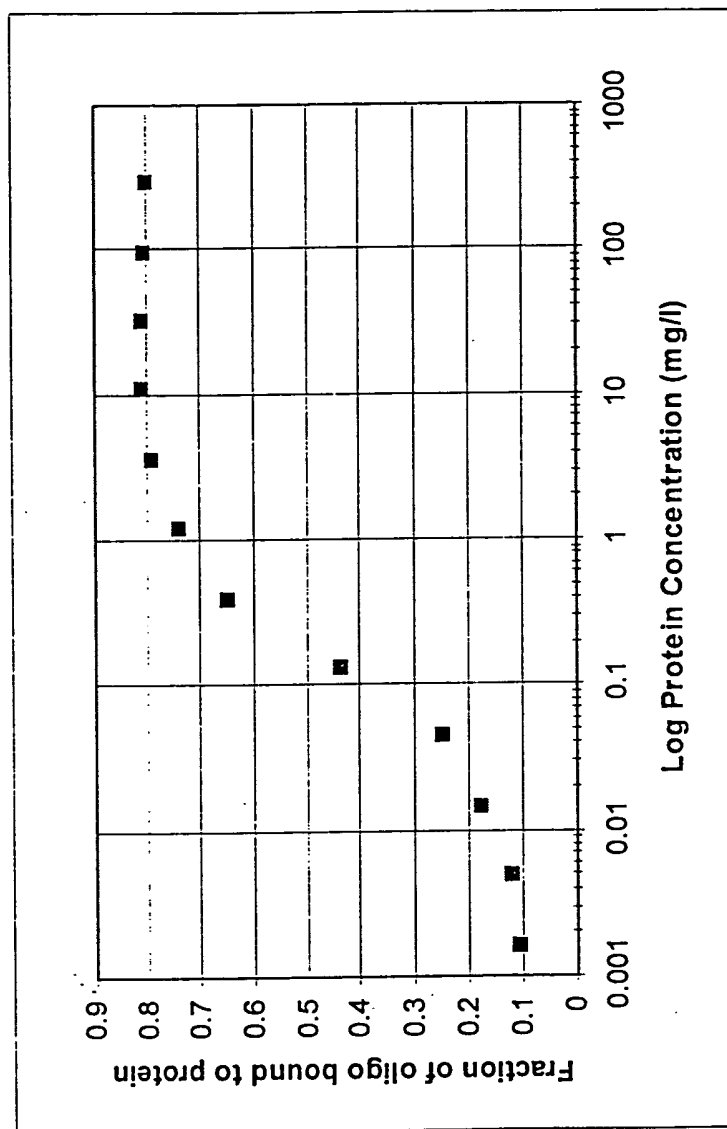


FIGURE 14

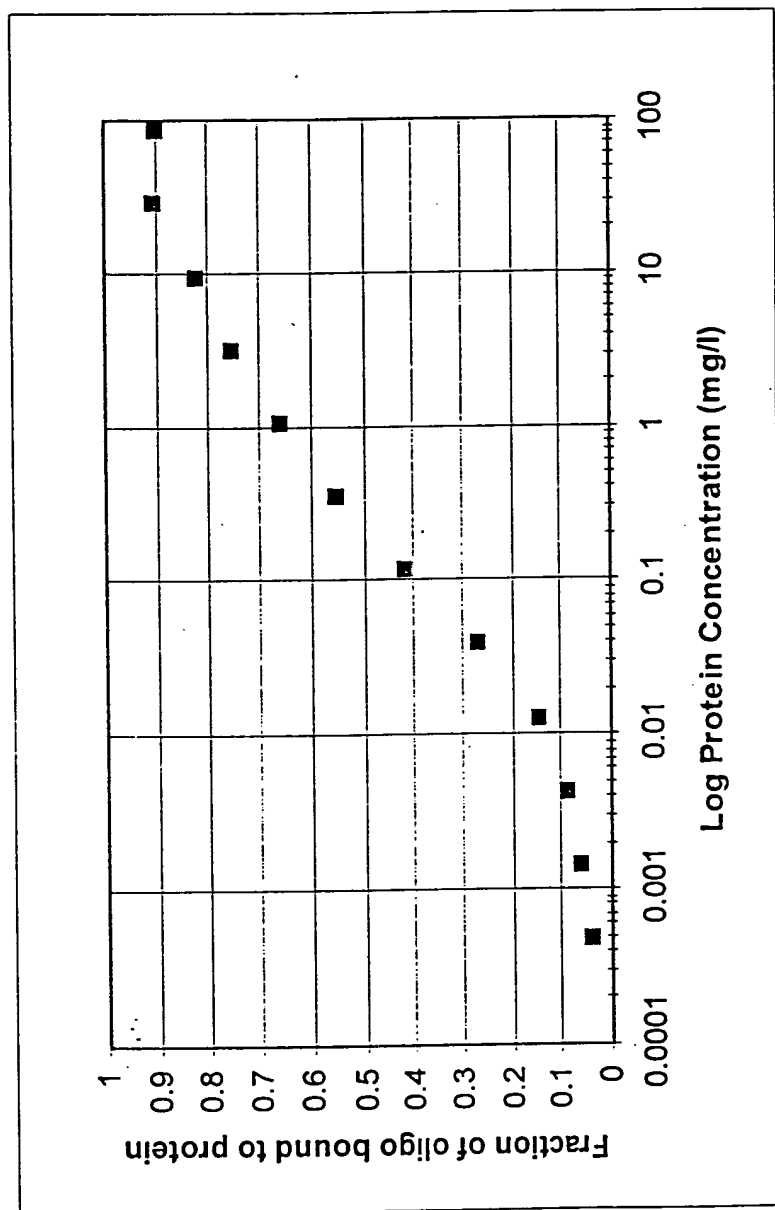


FIGURE 15

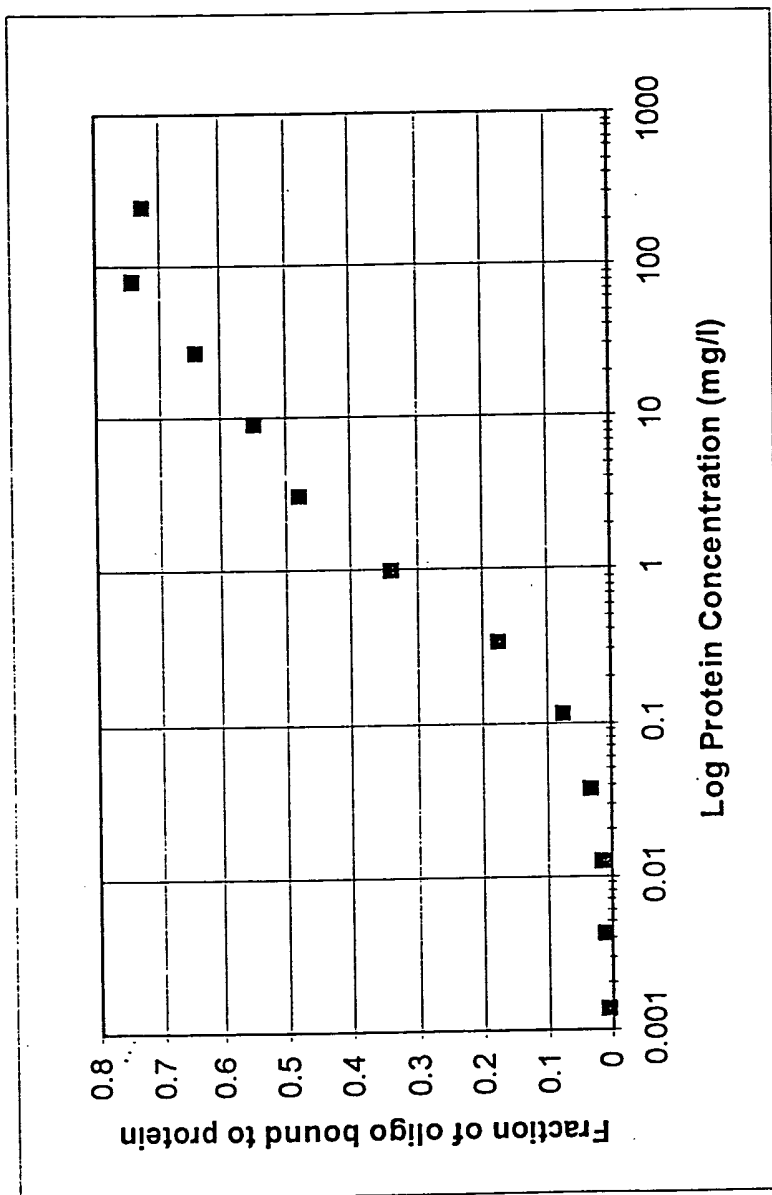


FIGURE 16

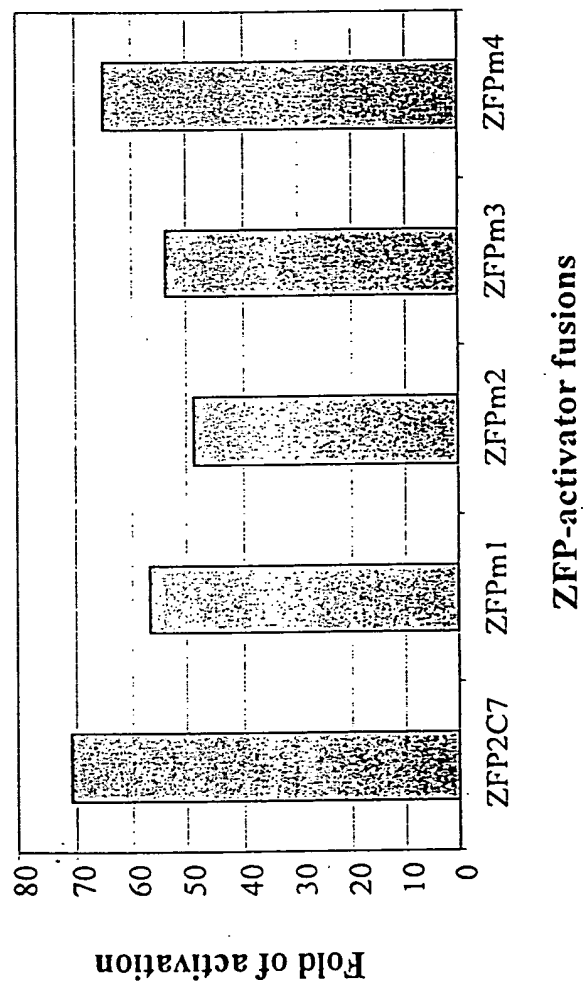
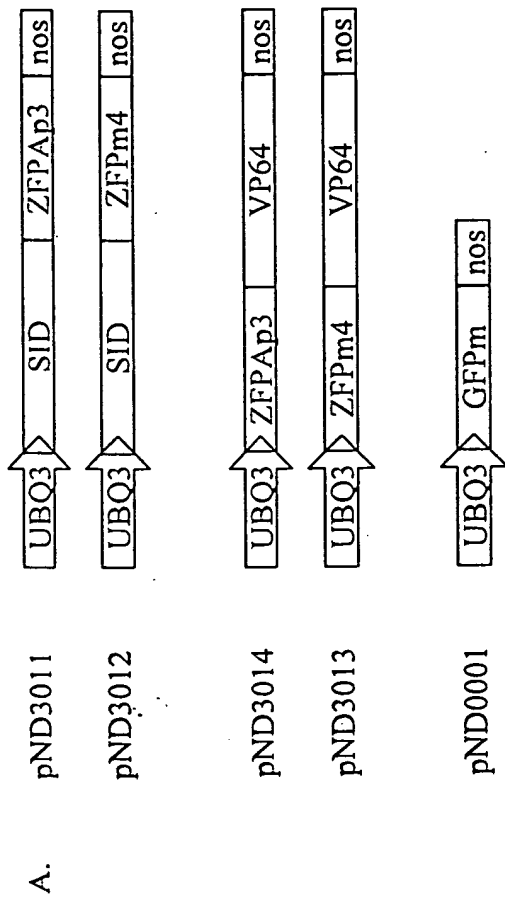


FIGURE 17

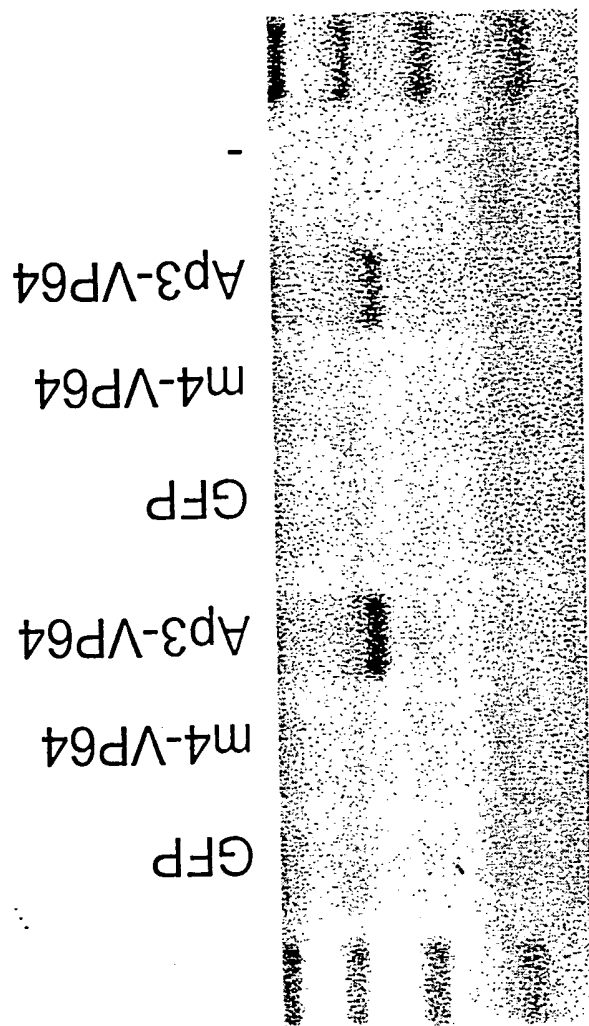


B.

pND0051	pND3011 in plant transformation vector with Hygmicine as selection marker
pND0052	pND3014 in plant transformation vector with Hygmicine as selection marker

FIGURE 18

FIGURE 19



09765555.011901

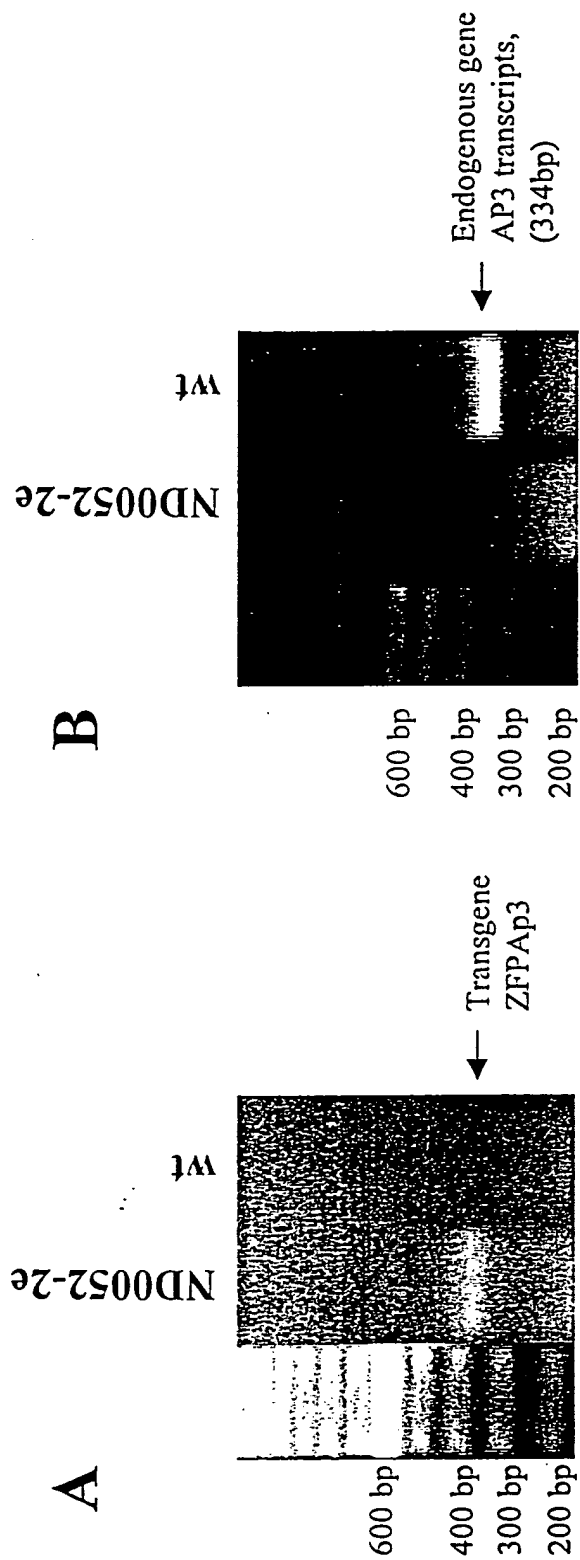


FIGURE 20

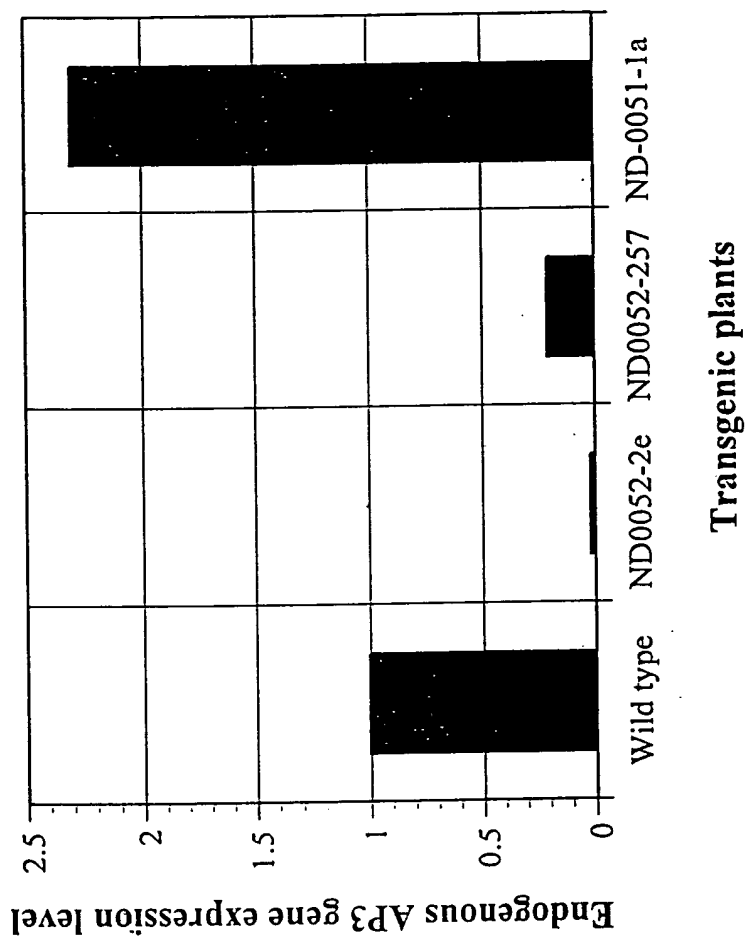


FIGURE 21

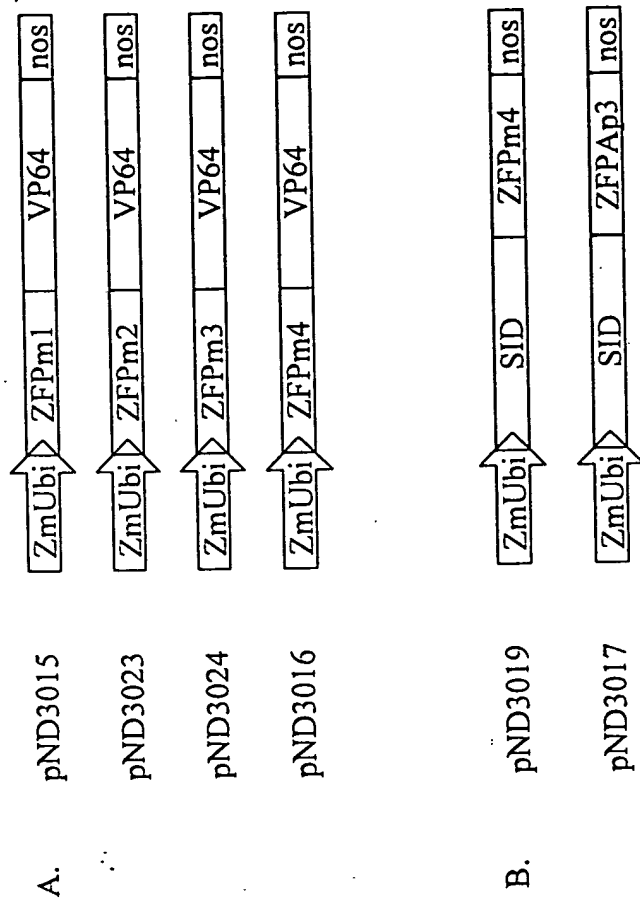


FIGURE 22

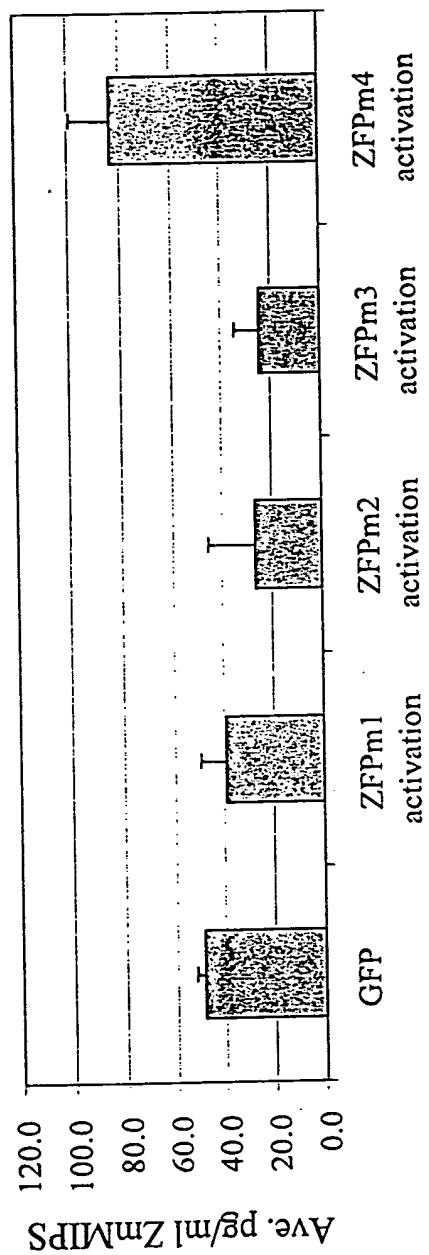


FIGURE 23

Figure 24

(1) Sequence of promoter CsVMV (Example 1A) (SEQ ID NO:1):

Tctagaaactagctccagaaggtaattatccaagatgtagcatcaagaatccaatgtttacgggaaaaactatggaa
gtattatgtgagctcagcaagaagcagatcaatatcgggcacatatgcaacctatgttcaaaaatgaagaatgtacagatacaag
atcctatactgccagaatacgaagaagaatacgtagaattgaaaaagaagaaccaggcgaagaaaagaatcttgaagacgta
agcactgacgacaacaatgaaaagaagaagataaggtcggtgattgtgaaagagacatagaggacacatgaaggtggaaaa
tgaaggggcgaaagtaaccttatcacaaggaatcttatccccactacttatcctttatattttccgtgtcattttgcccttgagt
ttcctataaaggaaccaagttcggcatttgtgaaaacaagaaaaatttggtgtaagctattttcttgaagtactgaggatacaact
tcagagaaatttgaagtttga

Total 531 bp

(2) Sequence of zinc finger protein 2C7 binding site (Example 1A) (SEQ ID NO:2):

GCG TGG GCG GCG TGG GCG

Total 18 bp.

(3) Sequence of promoter pc7rbTATA (Example 1A) (SEQ ID NO:3):

Cccgggtatataataagcttggcattccggtactgttggttaaagccacat

Total 51 bp.

(4) Sequence of pND3008 coding region (Example1B) (SEQ ID NO:4):

agcgtgacccggtcgtgccctctctagagataatgagcattgcatgtctaagttataaaaaattaccacatattttttg
tcacactgtttgaagtgcagtttatctatctttatacatatatttaaactttactctacgaataatataatctatagtactacaataatca
gtgttttagagaatcatataaatgaacagttagacatggctaaaggacaattgagtatttgacaacaggactctacagtttatcttt
ttagtgtcatgtgttcctttttttgcaaatagcttcacctatataatacttcatccattttattagtacatccatttagggtttagggtt
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ataatttagatataaaaatagaataaaaataaagtactaaaataaacaataaccctttaagaaattaaaaaactaaggaaacatttt
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gcacggcagctacgggggattccttccaccgctccttcgcttccctcctcgcggccgtaataaatagacacccctccaca

ccctctttccccaacctcgtgtgttcggagcgcacacacacacaaccagatctccccc aaatccacccgtcggcacctccgctt
caagggtacgccgctcgtccctccccccccccccctctctaccttctctagatcggcgttccgggtccatggttagggcccggtagttc
tactctgttcatgtttgtgtagatccgtgtttgtgtagatccgtgctgtagcgttcgtacacggatgcgacctgtacgtcagacac
gttctgattgctaacttgccagtgtttctcttggggaatcctgggatggctctagccgttccgcagacgggatcgatttcatgatttt
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cgggttttactgatgcatacacagagatgcttttgttcgcttgggtgtgatgatgtggtgtggttggcggtcgttcattcgttctagat
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atatgctctaaccttgagtacctatctattataataaacaagtatgtttataattttgatcttgatatacttggatgatggcatatgca
gcagctatatgtggatttttttagccctgccttcatacgtatttatttgccttggactgttcttttgcgatgctcacctgttgtttggtgt
tacttctgcaggctcactctagaggatctatggcccaggcggccctcgagctccctatgcttgcctgtcgagtcctgcgatcgc
cgcttttctaagtcggctgatctgaagcgccataccgcacacacagggcagaagcccttccagtgtcgaatatgcatgcgtaa
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tttccaggagtgtgaacgcaagaggcatacaaaaatccataccgggtgagaagccctatgcttgcctgtcgagtcctgcgatc
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agtttccaggagtgtgaacgcaagaggcatacaaaaatccatttaagacagaaggactctagaacttagggccaggccggc
caggctagcccga aaaagaaacgcaaagttgggcgcgccgacgcgctggacgatttcgatctcgacatgctgggttctgatgc
cctcgtatgactttgacctggatatgttgggaagcgacgcattggatgactttgatctggacatgctcggctccgatgctctggacg
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ggaggagctcaagatccccgaattccccgatcgttcaaacatttggcaataaagtttctaagattgaatcctgttgcggtcttgc
cgatgattatcatctaatttctgttgaattacgttaagcatgtaataattaacatgtaatgcatgacgttatttatgagatgggttttatga
ttagagtcccgcgaattatacatttaatacgcgatagaaaacaaaatatagcgcgcaaactaggataaattatcgcgcgcgggtgtca
tctatgttactagatccgggaattgggtac

Total:	3120 bp
ZmUbi promoter:	44 bp to 2026 bp
Six finger ZFP2C7:	2060 bp to 2588 bp
Nuclear localization signal:	2620 bp to 2641 bp
VP64 activation domain:	2641 bp to 2805 bp

HA eptitope tag:

2805 bp to 2836 bp

Nos terminator:

2884 bp to 3164 bp

(5) Sequence of pND3018 coding region (Example 1B) (SEQ ID NO:5):

agcgtgacccggctcgtgccctctctagagataatgagcattgcatgtctaagttataaaaaattaccacatattttttg
tcacacttggttgaagtgcagtttatctatctttatacatatattaaactttactctacgaataatataatctatagtactacaataatca
gtgttttagagaatcatataaatgaacagttagacatggctctaaaggacaattgagtatttgacaacaggactctacagtttatcttt
ttagtgtgcatgtgttctcctttttttgcaaataagcttcacatataataacttcacattttattagtacatccatttagggtttaggggt
aatggttttatagactaatttttttagtacatctattttattctatttttagcctctaaattaagaaaactaaaactctatttttagtttttattta
ataatttagatataaaatagaataaaataaagtactaaaaataaacaataaccctttaagaaataaaaaactaaggaaacatttt
tcttggttcgagtagataatgccagcctgttaaacgccgtcgacgagctaacggacaccaaccagcgaaccagcagcgtcgcg
tcgggccaagcgaagcagacggcagggcatctctgtcgtgcctctggaccctctcgagagttccgctccaccgttgacttg
ctccgctgtcggcatccagaaattgcgtggcggagcggcagacgtgagccggcagggcagggcctcctcctctcacg
gcacggcagctacgggggattccttcccaccgctccttcgcttccctcctcgcccgccgtaataaataagacacccctccaca
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 ggataaattatcgcgcggtgtcatctatgttactagatccgggaattccggaccggtaccagcggcc

Total:	3068 bp
ZmUbi promoter:	44 bp to 2026 bp
SID repression domain:	2066 bp to 2173 bp
Nuclear localization signal:	2174 bp to 2194 bp
Six finger ZFP2C7:	2207 bp to 2735 bp
HA epitope tag:	2762 bp to 2791 bp
Nos terminator:	2820 bp to 3112 bp

(6) Sequence of 6X2C7 binding site (SEQ ID NO:6):

Cgtgctagcgcgtggcgggcgtgggcgaacaagcgtggcgggcgtgggcgaacaagcgtggcgggcgtgggc
 gactagtgtgtagcgcgtggcgggcgtgggcgaacaagcgtggcgggcgtgggcgaacaagcgtggcgggcgtgggcgac
 tagtg

Total: 155 bp

(7) Sequence of 3 finger protein C7:

Atggcccaggcgccctcgagccctatgcttgcctgtcgagtcctgcgatgccgcttttctaagtcggctgatctg
 aagcgccatatccgcatccacacaggccagaagcccttccagtgtcgaatatgcatgcgtaacttcagtcgtagtaccacctta
 ccaccacatccgcacccacacaggcgagaagccctttgcctgtgacatttgtgggaggaagttgccaggagtgaacgca
 agaggcataccaaaatccatttaagacagaaggactctagaactagtggccaggccggccaggctagc

Total: 314 bp

(8) Amino acid sequence of 3 finger protein C7:

Maqaalepyacpvescdrrfsksadlkrhirihtgqkpfqcrimrnfsrsdhlthirthtgekpfacdicgrkfar
sderkrhtkihlrqkdsrtsgqagqas

Total: 105 aa

(9) Sequence of zinc finger protein ZFPap3 binding site:

GAT GGA GTT GAA GAA GTA

Total: 18 bp

(10) Sequence of zinc finger protein ZFPm1 and ZFPm2 binding site m12:

GCC TCC TTC CTC CTC TCA CTC

Total: 21 bp

ZFPm1 binding site: compliment strand of 1 to 18

ZFPm2 binding site: compliment strand of 4 to 21

(11) Sequence of zinc finger protein ZFPm3 and ZFPm4 binding site m34:

GCC AAC TAC TAC GGC TCC CTC ACC

Total: 21 bp

ZFPm3 binding site: compliment strand of 1 to 18

ZFPm4 binding site: compliment strand of 7 to 24

(12) Partial sequence of pMal-m1 (1-3300 bp) and zinc finger protein ZFPm1

(2719-3270 bp) (SEQ ID NO:14):

ccgacaccatcgaatggtgcaaaaccttgcgggtatggcatgatagcgcccggaagagagtcaattcagggtggt
gaatgtgaaaccagtaacgttatacgatgtcgcagagtatgccggtgtctcttatcagaccgttcccgcgtggtgaaccaggcca
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aaattcgagaaagataccggaattaaagtcaccgttgagcatccggataaactggagagaaattccacaggttgccggaact
ggcgatggccctgacattatcttctgggcacacgaccgcttgggtggctacgctcaatctggcctgttggtgaaatcaccccg
acaaagcgtccaggacaagctgtatccgttacctgggatgccgtacttacaacggcaagctgattgcttaccgatcgtgtt
gaagcgttatcgtgattataacaaagatctgctgccgaaccggccaaaacctgggaagagatccggcgctggataaagaa
ctgaaagcgaaaggtgaagcgcgctgatgtcaacctgcaagaaccgtacttcacctggccgctgattgctgctgacgggggt
tatgcgttaagtatgaaaacggcaagtacgacattaaagacgtgggcgtggataacgctggcgcgaaagcgggtctgaccttc
ctggttgacctgattaaaaacaaacacatgaatgcagacaccgattactccatcgagaagctgcctttaataaaggcgaaacag
cgatgaccatcaacggccccgtgggcatggtccaacatcgacaccagcaaaagtgaattatggtgtaacggtagtcccaccttca
agggtcaaccatccaaaccgttcgttggtgctgagcgcaggtattaacgccgccagtcggaacaaagagctggcaaaaga
gttcctcgaaaactatctgctgactgatgaaggtctggaagcggtaataaagacaaaccgtgggtgccgtagcgtgaagctt
tacgaggaagagttggcgaaagatccacgtattgccgccaccatggaaaacgccagaaaggtgaaatcatgccgaacatcc
cgcatgtccgcttctggtatgccgtgctactgcggtgatcaacgccgccagcggctgctcagactgtcgtgaagccctga
aagacgcgcagactaattcgagctgaacaacaacaataacaataacaacacctcgggatcgagggaaggatttcagaa
ttcggtacctcttctctgtggccagcggccctcgagccggggagaagccctatgcttgccggaatgtggtgaagtccttctc
tcagagctctcacctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtcgggcaaatcttttag
ccagtcagcaacctggtgcgccatcaacgcactcactggtgcgagaagccatacaaatgtccagaatgtggcaagtcttctct
cggcttgacaatctcgtccggcaccacgtactcacaccggggagaagccctatgcttgccggaatgtggtgaagtccttcagcc
gcagcgataacctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtcgggcaaatcttttagc
caggccggccacctggccagccatcaacgcactcactggtgcgagaagccatacaaatgtccagaatgtggcaagtcttctct
cggcttgacaatctcgtccggcaccacgtactcacaccggtaaaaaactagtgccaggccggccagtagccgtacgacgt
tccggactacgct

Total: 514 bp

Primer F1-f1 of ZFPm1: 2770 bp to 2850 bp

Primer F1-f2 of ZFPm1: 2740 bp to 2790 bp

Primer F2-f of ZFPm1: 2867 bp to 2940 bp

Primer F2-b of ZFPm1: 2824 bp to 2889 bp

Primer F3-b1 ZFPm1: 2916 bp to 2973 bp

Primer F3-b2 ZFPm1: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm1: 3022 bp to 3102 bp

Primer F4-f2 of ZFPm1: 2992 bp to 3042 bp

Primer F5-f of ZFPm1: 3119 bp to 3192 bp

Primer F5-b of ZFPm1: 3076 bp to 3141 bp

Primer F6-b1 of ZFPm1: 3168 bp to 3225 bp

Primer F6-b2 of ZFPm1: 3205 bp to 3273 bp

(13) Sequence of zinc finger protein ZFPm1

(Translated from pMal-m1: 2719-3270 bp):

Aqaalepgekpyacpecgksfsdpghlvhrhqrthtgekpykpecgksfsqrahlerhqrthtgekpykpec
gksfsqssnlvrhqrthtgekpyacpecgksfsrsdnlvrhqrthtgekpykpecgksfsrsdnlvrhqrthtgekpykpe
cgksfsqaghlashqrthtgkktsgqag

(14) Partial sequence of pMal-m2 (1-3300 bp) and zinc finger protein ZFPm2

(2719-3270 bp) (SEQ ID NO:15):

ccgacaccatcgaatggtgcaaaacctttcgcggtatggcatgatagcgcccggaagagagtcattcagggtggt
gaatgtgaaaccagtaacgttatacgaatgctgcagagtatgccggtgtctcttatcagaccgttcccgcgtggtgaaccaggcca
gccacgtttctgcgaaaacgcgggaaaaagtgaagcggcgatggcggagctgaattacattccaaccgcgtggcacaaca
actggcgggcaaacagtcgttgctgattggcgttgccacctcagctctggcctgcacgcgccgtcgcaaatgtcgcggcgat
taaactcgcgccgatcaactgggtgccagcgtggtggtgctgatggtagaacgaagcggcgctgaagcctgtaaagcggcg
gtgcacaatcttctcgcgaacgcgtcagtggtgatcattaactatccgctggatgaccaggatgccattgctgtggaagctg
cctgcactaatgttcggcggtatttcttgatgtctctgaccagacacccatcaacagtattttctcccatgaagacgggtacgcga
ctgggcgtggagcatctggtcgcattgggtcaccagcaaatcgcgctgtagcgggcccattaagtctgtctcggcgctctgc

gtctggctggctggcataaatatctcactcgcaatcaaattcagccgatagcggaaacgggaaggcgactggagtccatgtccg
gttttcaaaaaccatgcaaatgctgaatgagggcatcgttccactcgcatgctggtgccaacgatcagatggcgctgggcgc
aatgcgcgccattaccgagtcgggctgcgcgttggtgcggatctcggtagtgggatacgacgataccgaagacagctcat
gttataatcccgccgtaaccacatcaaacaggatttgcctgctggggcacaaccagcgtggaccgctgctgcaactctctcag
ggccaggcgggtgaagggaatcagctgttgcctcactggtgaaaagaaaaaccacctggcgcccaatacgcgaaccg
cctctccccgcgcgttggccgattcattaatgcagctggcacgacaggttcccgactggaaagcgggcagtgagcgcaacgc
aattaatgtgagtagctcactcattaggcacaattctcatgtttgacagcttatcatcgactgcacggtgcaccaatgcttctggcg
caggcagccatcgggaagctgtggtatggctgtgcaggtcgtaaatcactgcataattcgtgcgtcaaggcgactcccgttct
ggataatgtttttgcgccgacatcataacggttctggcaaatattctgaaatgagctgttgacaattaatcatcggtcgtataatgt
gtggaattgtgagcggataacaatttcacacaggaaacagccagtcggttaggtgtttcacgagcacttcaccaacaaggacc
atagattatgaaaactgaagaaggtaaaactggtaatctggattaacggcgataaaggctataacggctcgcgtgaagtcggtgaag
aaattcgagaaagataccggaattaaagtcaccgttgagcatccggataaactggaagagaaattccacaggttgcggcaact
ggcgatggccctgacattatcttctgggcacacgaccgcttgggtggctacgctcaatctggcctgttggctgaaatcaccccg
acaaagcgttccaggacaagctgtatccgtttacctgggatgccgtacgttacaacggcaagctgattgcttaccgatcgctgtt
gaagcgttatcgtgattataacaaagatctgctgccgaaccggcaaaaacctgggaagagatccggcgctggataaagaa
ctgaaagcgaaggtgaagagcgcgctgatgttcaacctgcaagaaccgtacttcacctggccgctgattgctgctgacgggggt
tatgcgttcaagtatgaaaacggcaagtagacattaagacgtgggcgtggataacgctggcgcgaaagcgggctgaccttc
ctggttgacctgattaaaaacacacatgaatgcagacaccgattactccatcgagaagctgcctttaataaaggcgaaacag
cgatgaccatcaacggcccgtggcgatggtccaacatcgacaccagcaaaagtgaattatggtgtaacgggtactgccgacctca
agggtcaaccatccaaaccgttcgttggcgctgctgagcgcaggtattaacgccgccagtcggaacaaagagctggcaaaaga
gttcctcgaaaactatctgctgactgatgaaggcttggaaagcggtaataaagacaaaaccgctgggtgccgtagcgtgaagct
tacgaggaagagttggcgaaagatccacgtattgccgccaccatggaaaacgccagaaaggtgaaatcatgccgaacatcc
cgcagatgtccgcttctggtatgccgtgcgtactgcggtgatcaacgccgccagcggctcgcagactgtcgatgaagccctga
aagacgcgcagactaattcgagctcgaacaacaacaataacaataacaacaccccggtatcgagggaaggatttcagaa
ttcgatcctcttctctgtggcccaggcggccctcgagcccggggagaagccctatgcttgcgggaatgtggtgaagtccttct
tcagagctctcacctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatcttttag
ccagtccagcaacctggtgcgccatcaacgcactcactactggcgagaagccatacaaatgtccagaatgtggcaagtcttctct
cggcttgacaatctcgtccggcaccaacgtactcacaccggggagaagccctatgcttgcgggaatgtggtgaagtccttcagcc
gcagcgataacctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatcttttagc
caggccggccacctggccagccatcaacgcactcactactggcgagaagccatacaaatgtccagaatgtggcaagtcttctct

cggtctgacaatctcgccggcaccaacgtactcacaccggtaaaaaactagtgccaggccggccagtagccgtacgacgt
tccggactacgct

Total: 514 bp

Primer F1-f1 of ZFPm2: 2770 bp to 2850 bp

Primer F1-f2 of ZFP m2: 2740 bp to 2790 bp

Primer F2-f of ZFP m2: 2867 bp to 2940 bp

Primer F2-b of ZFPm2: 2824 bp to 2889 bp

Primer F3-b1 ZFPm2: 2916 bp to 2973 bp

Primer F3-b2 ZFPm2: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm2: 3022 bp to 3102 bp

Primer F4-f2 of ZFPm2: 2992 bp to 3042 bp

Primer F5-f of ZFPm2: 3119 bp to 3192 bp

Primer F5-b of ZFPm2: 3076 bp to 3141 bp

Primer F6-b1 of ZFPm2: 3168 bp to 3225 bp

Primer F6-b2 of ZFPm2: 3205 bp to 3273 bp

- (15) Partial sequence of pMal-m3 (1-3300 bp) and zinc finger protein ZFPm3
(2719-3270 bp) (SEQ ID NO:16):

ccgacaccatcgaatggtgcaaaaccttctcggtatggcatgatagcgcccggaagagagtcaattcagggtggt
gaatgtgaaaccagtaacgttatacgtatgctgcagagtatgccggtgtctcttatcagaccgttcccgctggtgaaccaggcca
gccacgttctgcgaaaacgcgggaaaaagtgaagcggcgatggcggagctgaattacattccaaccgcgtggcacaaca
actggcgggcaaacagtcgttgctgattggcgttgccacctcagctctggccctgcacgcgccgtcgcaaatgtcgcggcgat
taaattctcgccgatcaactgggtgccagcgtggtggtgctgatggtagaacgaagcggcgtcgaagcctgtaaagcggcg
gtgcacaattctctcgcaacgcgtcagtggtgatcattaactatccgtggatgaccaggatgccattgctgtggaagctg
cctgcactaatgttccggcgttatttctgatgtctctgaccagacacctcaacagtatttttctccatgaagacggtacgga
ctgggcgtggagcatctggtcgcattgggtcaccagcaaatcgcgtgttagcgggccattaagtctgtctcggcgcgtctgc
gtctggtggtggcataaatactcactcgcaatcaaattcagccgatagcggaacgggaaggcgactggagtgcatgtccg
gttttaacaaaccatgcaaatgctgaatgagggcatcgttccactcgcatgctggttccaacgatcagatggcgtgggcgc
aatgcgcgccattaccgagtcggggtgcgcgttggtgcggatatctcgtagtgggatacgacgataccgaagacagctcat
gttatatcccgccgttaaccaccatcaaacaggattttcgctgtggggcaaacaccagcgtggaccgctgctgcaactctctcag

ggccaggcgggtgaaggccaatcagctgttccccgtctcactggtgaaaagaaaaaccacccctggcgccaatacgcgaaccgc
cctctccccgcgcgttggccgattcattaatgcagctggcacgacaggttccccgactggaaagcgggcagtgagcgcaacgc
aattaatgtgagttagctcactcattaggcacaattctcatgtttgacagcttatcatcactgcacgggtgcaccaatgcttctggcgt
caggcagccatcggaaactgtggtatggctgtgcaggtcgtaaatcactgcataattcgtgtcgtcaaggcgcactcccgttct
ggataatgtttttgcgccgacatcataacggttctggcaaataattctgaaatgagctgttgacaattaatcatcggctcgtataatgt
gtggaattgtgagcggataacaatttcacacaggaacagccagtcctgttaggtgtttcacgagcacttcaccaacaaggacc
atagattatgaaaactgaagaaggtaaactggtaactcggattaacggcgataaaggctataacggctcgcgtgaagtcggtaag
aaattcgagaaagataccggaattaaagtcaccgttgagcatccggataaactggaagagaaattcccacagggttcgggcaact
ggcgatggccctgacattatcttctgggcacacgaccgcttgggtggctacgctcaatctggcctgttggtgaaatcaccggg
acaaagcgttccaggacaagctgtatccgtttacctgggatgccgtacgttacacggcaagctgattgcttaccgatcgtgtt
gaagcgttatcgtgatttataacaaagatctgctgccgaaccgccaaaaacctgggaagagatccggcgctggataaagaa
ctgaaagcgaaaggtaagagcgcgctgatgttaacctgcaagaaccttacttcacctggccgctgattgctgctgacgggggt
tatcggttcaagtatgaaaacggcaagtacgacattaaagacgtgggcgtggataacgctggcgcgaaagcgggtctgaccttc
ctggttgacctgattaaaaacaaacacatgaatgcagacaccgattactccatcgagaagctgcctttaataaaggcgaaacag
cgatgaccatcaacggcccgtgggcatgggtccaacatcgacaccagcaaagtgaattatggtgtaacggtactgccgacctca
agggtcaaccatccaaaccgttcgttggcgtgctgagcgcaggtattaacgccgccagtcaggcaaaaagagctggcaaaaaga
gttcctcgaaaactatctgctgactgatgaaggcttgggaagcgggtaataaagacaaaccgctgggtgccgtagcgtgaagtct
tacgaggaagagttggcgaaagatccacgtattgccgccaccatggaaaacgccgagaagggtgaaatcatgccgaacatcc
cgcagatgtccgcttcttggtatgccgtgcgtactgcggtgatcaacgccgccagcggctcgtcagactgtcgtgatgaaccctga
aagacgcgcagactaattcgagctcgaacaacaacaataacaataacaacaacctcgggatcagggaaggatttcagaa
ttcgatcctcttctctgtggcccaggcggccctcgagcccggggagaagccctatgcttgcgggaatgtggtgaagtccttca
gcgatcctggccacctgggttcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatctttta
gcaccagcggctccctgggtgcgccatcaacgcactcatactggcgagaagccatacaaatgtccagaatgtggcaagtctttca
gccagagctccagcctgggtgcgccaccaacgtactcacaccggggagaagccctatgcttgcgggaatgtggtgaagtccttca
gccagagcagctccctgggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatctttt
agtgactgccgcgaccttgctcggcatcaacgcactcatactggcgagaagccatacaaatgtccagaatgtggcaagtctttct
cccaatccagccatctcgtccggaccaacgtactcacaccggtaaaaaaactagtggccaggccggccagtagccgtacgac
gttccggactacgt

Total: 514 bp

Primer F2-f of ZFP m3: 2867 bp to 2940 bp
Primer F2-b of ZFPm3: 2824 bp to 2889 bp
Primer F3-b1 ZFPm3: 2916 bp to 2973 bp
Primer F3-b2 ZFPm3: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm3: 3022 bp to 3102 bp
Primer F4-f2 of ZFPm3: 2992 bp to 3042 bp
Primer F5-f of ZFPm3: 3119 bp to 3192 bp
Primer F5-b of ZFPm3: 3076 bp to 3141 bp
Primer F6-b1 of ZFPm3: 3168 bp to 3225 bp
Primer F6-b2 of ZFPm3: 3205 bp to 3273 bp

(16) Partial sequence of pMal-m4 (1-3300 bp) and zinc finger protein ZFPm4
(2719-3270 bp) (SEQ ID NO:17):

ccgacaccatcgaatggtgcaaacctttcgcggtatggcatgatagcgcccggaagagagtcaattcagggtggt
gaatgtgaaccagtaacgttatcatgatgtcgcagagtatgccggtgtctcttatcagaccgtttcccgctggtgaaccaggcca
gccacgtttctgcgaaaacgcgggaaaaagtgaagcggcgatggcggagctgaattacattccaaccgcgtggcacaaca
actggcgggcaaacagtcgttgctgattggcgttgccacctccagctctggccctgcacgcgccgtcgcaattgtcgcggcgat
taaattctgcgccgatcaactgggtgccagcgtgggtgtcgtatggtagaacgaagcggcgtcgaagcctgtaaagcggcg
gtgcacaattctctcgcgaacgcgtcagtggtgtgatcattaactatccgctggatgaccaggatgccattgctgtggaagctg
cctgcactaatgttccggcgttatttctgatgtctctgaccagacacccatcaacagtatttttctccatgaagacggtacgcga
ctggcgctggagcatctggtcgcattgggtcaccagcaaatcgcgctgtagcggggccattaagtctgtctcggcgcgtctgc
gtctggctggctggcataaatatctcactcgaatcaaattcagccgatagcggaaacgggaaggcgactggagtgccatgtccg
gtttcaacaaacatgcaaatgctgaatgagggcatcgttccactgcgatgctggttccaacgatcagatggcgtgggcgc
aatgcgcgccattaccgagtcgggctgcgcgttggtgcggatatctcggtagtgggatacgacgataccgaagacagctcat
gttatatcccgccgttaaccacatcaaacaggattttcgcctgctggggcaaacagcgtggaccgcttgcgaactctctcag
ggccaggcggtgaagggaatcagctgttgcctgtcactggtgaaaagaaaaaccacctggcgcccaatacgcaaacg
cctctccccgcgcttgccgattcattaatgcagctggcacgacaggttcccgactggaaagcgggcagtgagcgcaacgc
aattaatgtgagttagctcactcattaggcacaattctcatgttgacagcttatcatcgactgcacggtgcaccaatgcttctggcgt
caggcagccatcggaaagctgtggtatggctgtgcaggtcgtaaatcactgcataattcgtgtcgtcgaaggcgactcccgttct
ggataatgtttttgcgccgacatcataacggttctggcaaatattctgaaatgagctgttgacaattaatcatcggtcgtataatgt

gtggaattgtgagcggataacaatttcacacaggaacagccagtcggttaggtgtttcacgagcattcaccaacaaggacc
 atagattatgaaaactgaagaaggtaaactggtaacttgattaacggcgataaaggctataacggctcgcgtgaagtcggttaag
 aaattcgagaaagataccggaattaaagtcaccgttgagcatccggataaactggaagagaaattcccacaggttgcggcaact
 ggcgatggccctgacattatcttctgggcacacgaccgcttgggtggctacgctcaatctggcctgttggctgaaatcacccgg
 acaaagcgttccaggacaagctgtatccgtttacctgggatgccgtacgttacaacggcaagctgattgcttaccgatcgtgtt
 gaagcgttatcgtgattataacaagatctgctgccgaacccgcaaaaacctgggaagagatcccgccgctggataaagaa
 ctgaaagcgaaaggtaagagcgcgctgatgttcaacctgcaagaaccgtacttcacctggccgctgattgctgctgacgggggt
 tatgcttcaagatgaaaacggcaagtacacattaaagacgtggcgctggataacgctggcgcaagcgggtctgaccttc
 ctggttgacctgattaaaaacaacacatgaatgcagacaccgattactccatcgagaagctgcctttaataaaggcgaaacag
 cgatgaccatcaacggcccggtggcgatggtccaacatcgacaccagcaaagtgaattatggtgtaacgggtactgccgacctta
 agggtaacatccaacccgttctggtggcgctgagcgcaggtattaacgccgccagtcgcaacaagagctggcaaaaga
 gttctctgaaaactatctgctgactgatgaaggcttgaagcgggttaataaagacaaaccgtgggtgccgtagcgtgaagctt
 tacgaggaagagttggcgaaagatccacgtattgccgccaccatggaaaacgccagaaagggtgaaatcatgccgaacatcc
 cgcagatgtccgcttctggtatgccgtgctgactgcggtgatcaacgccgccagcggctcgtcagactgtcgtgaagccctga
 aagacgcgcagactaattcgagctcgaacaacaacaataacaataacaacctcgggatcgaggggaaggatttcagaa
 ttccgatctcttctctgtggccagcgccctcgagcccgaggagaagccctatgcttgcgggaatgtggttaagtcctca
 gccagagcagctccctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatctttt
 agccagagcagcagcctggtgcgccatcaacgcactcacttggcgagaagccatacaaatgtccagaatgtggcaagtcttctc
 agtgattgtcgtgatcttgcgaggcaccaacgtactcacaccggggagaagccctatgcttgcgggaatgtggttaagtccttc
 tcagagctctcacctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatcttttag
 ccgcagcgataacctggtgcgccatcaacgcactcacttggcgagaagccatacaaatgtccagaatgtggcaagtcttctca
 acttcaggccatttggctccgtcaccaacgtactcacaccggtaaaaaactagtgccagggccggccagtagccgtacgacgtt
 ccggactacgct

Total: 514 bp

Primer F1-f1 of ZFPm4: 2770 bp to 2850 bp

Primer F1-f2 of ZFPm4: 2740 bp to 2790 bp

Primer F2-f of ZFPm4: 2867 bp to 2940 bp

Primer F2-b of ZFPm4: 2824 bp to 2889 bp

Primer F3-b1 ZFPm4: 2916 bp to 2973 bp

Primer F3-b2 ZFPm4: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm4: 3022 bp to 3102 bp
Primer F4-f2 of ZFPm4: 2992 bp to 3042 bp
Primer F5-f of ZFPm4: 3119 bp to 3192 bp
Primer F5-b of ZFPm4: 3076 bp to 3141 bp
Primer F6-b1 of ZFPm4: 3168 bp to 3225 bp
Primer F6-b2 of ZFPm4: 3205 bp to 3273 bp

(17) Partial sequence of pMal-Ap3 (1-3300 bp) and zinc finger protein ZFPap3

(2719-3270 bp) (SEQ ID NO:18):

ccgacaccatcgaatggtgcaaacctttcgcggtatggcatgatagcggcgggaagagagtcattcagggtggt
gaatgtgaaaccagtaacgttatcatgatgtcgcagagtatgccggtgtctcttatcagaccgtttcccgctggtgaaccaggcca
gccacgtttctgcgaaaacgcgggaaaaagtgaagcggcgatggcggagctgaattacattccaaccgcgtggcacaaca
actggcgggcaaacagtcgttgctgattggcgttgccacctcagcttggccctgcacgcggcgtcgaaattgtcgcggcgat
taaattctcgcgccgatcaactgggtgccagcgtggtggtgtcgtatgtagaacgaagcggcgtcgaagcctgtaaagcggcg
gtgcacaattctctcgcgcaacgcgtcagtggtgatcattaactatccgctggatgaccaggatgccattgctgtggaagctg
cctgcactaatgttccggcggtattttctgatgtctctgaccagaccccatcaacagtatttttctccatgaagacggtagcga
ctgggcgtggagcatctggtcgattgggtcaccagcaaatcgcgtgttagcggggccattaagtctgtctcggcgcgtctgc
gtctggctggctggcataaatctcactcgaatcaaattcagccgatagcggaaagggaaggcgactggagtccatgtccg
gttttcaacaaccatgcaaatgtgaatgagggcatcgttccactgcgatgctggttgccaacgatcagatggcgtgggcgc
aatgcgcgccattaccgagtcggggtgcgcgttggtgcggatatctcggtagtgggatacgacgataccgaagacagctcat
gttatatcccgcgttaaccaccatcaaacaggattttcgctgctggggcaaacaccagcgtggaccgcttgcgaactctctcag
ggccaggcgggtgaagggaatcagctgttggcgtctcactggtgaaaagaaaaaccacctggcgcccaatacgaaccg
cctctccccgcgcttgccgattcattaatgcagctggcacgacaggtttcccgactggaaagcgggcagtgagcgcaacgc
aattaatgtgagttagctcactcattaggcacaattctcatgtttgacagcttatcatcgactgcacggtgcaccaatgcttctggcgt
caggcagccatcggaagctgtggtatggctgtgcaggtcgtaaatcactgcataattcgtgtcgtcaaggcgactcccgttct
ggataatgtttttgcgccgacatcataacggttctggcaaatattctgaaatgagctgttgacaattaatcatcggtcgtataatgt
gtggaattgtgagcggataacaattcacacaggaaacagccagtcggttaggtgttttacgagcacttcaccaacaaggacc
atagattatgaaaactgaagaaggtaaactgtaactctggattaacggcgataaaggctataacggctctcgtgaagtcggtgaag
aaattcgagaaagataccggaattaaagtcaccgttgagcatccggataaactggaagagaaattcccacaggttgcggcaact
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 agccagcgcgccacctggaacgccatcaacgcactcatactggcgagaagccatacaaatgtccagaatgtggcaagtcttt
 ctcaacttcaggcaacttggtccgtcaccaacgtactcacaccggtaaaaaactagtgccaggccggccagtagccgtacga
 cgttccggactacgt

Total: 514 bp

Primer F1-f1 of ZFPap3: 2770 bp to 2850 bp

Primer F1-f2 of ZFPap3: 2740 bp to 2790 bp

Primer F2-f of ZFPap3: 2867 bp to 2940 bp

Primer F2-b of ZFPap3: 2824 bp to 2889 bp

Primer F3-b1 ZFPap3: 2916 bp to 2973 bp

Primer F3-b2 ZFPap3: 2953 bp to 3021 bp

Primer F4-f1 of ZFPap3: 3022 bp to 3102 bp

Primer F4-f2 of ZFPap3: 2992 bp to 3042 bp

Primer F5-f of ZFPap3: 3119 bp to 3192 bp

Primer F5-b of ZFPap3: 3076 bp to 3141 bp

Primer F6-b1 of ZFPap3: 3168 bp to 3225 bp

Primer F6-b2 of ZFPap3: 3205 bp to 3273 bp

(18) Sequence of oligo m12 (SEQ ID NO:19):

Biotin-GGa gcc tcc ttc ctc ctc tca ctc GGG TTTT CCC gag tga gag gag gaa gga
ggc tCC

Total: 58 bp

Lower case sequence: ZFPm1 and ZFPm2 binding site m12

(19) Sequence of oligo m34 (SEQ ID NO:20):

Biotin-GGa gcc aac tac tac ggc tcc ctc acc GGG TTTT CCC ggt gag gga gcc gta
gta gtt ggc tCC

Total: 58 bp

Lower case sequence: ZFPm3 and ZFPm4 binding site m34

(20) Sequence of oligo Ap3 (SEQ ID NO:21):

Biotin-GGt tac ttc ttc aac tcc atc GGG TTTT CCC gat gga gtt gaa gaa gta aCC

Total: 52 bp

Lower case sequence: ZFPap3 binding site

(21) Sequence of oligo NRI-1 (SEQ ID NO:22):

Biotin-GG ttc tac ccc tcc cac cgc GGG TTTT CCC gcg gtg gga ggg gta gaa CC

Total: 51 bp

(22) Sequence of oligo NRI-2 (SEQ ID NO:23):

Biotin-GG tgc ggc gac tgc agc agc GGG TTTT CCC gct gct gca gtc gcc gca CC

Total: 51 bp

(23) Sequence of oligo hHD-I (SEQ ID NO:24):

Biotin-GG ggc ccc gcc tcc gcc ggc GGG TTTT CCC gcc ggc gga ggc ggg gcc
CC

Total: 51 bp

(24) Sequence of oligo hHD-II (SEQ ID NO:25):

Biotin-GG ggc agc ccc cac ggc gcc GGG TTTT CCC ggc gcc gtg ggg gct gcc CC

Total: 51 bp

(25) Sequence of oligo c5p1-g (SEQ ID NO:26):

Biotin-GG gac acc ccc aac ccc gcc GGG TTTT CCC ggc ggg gtt ggg ggt gtc CC

Total: 51 bp

(26) Sequence of oligo c5p3-g (SEQ ID NO:27):

Biotin-GG ctc tgc tca tcc cac tac GGG TTTT CCC gta gtg gga tga gca gag CC

Total: 51 bp

(27) Sequence of oligo B3c2 (SEQ ID NO:28):

Biotin-GG acc cac cgc gtc ccc tcc GGG TTTT CCC gga ggg gac gcg gtg ggt CC

Total: 51 bp

(28) Sequence of oligo e2c-g (SEQ ID NO:29):

Biotin-GG cac tgc ggc tcc ggc ccc GGG TTTT CCC ggg gcc gga gcc gca gtg CC

Total: 51 bp

(29) Sequence of primer Ap3-F (SEQ ID NO:30):

GGCGAGAGGGAAGATCCAG

Total: 19 bp

(30) Sequence of primer NZlib5' (SEQ ID NO:31):

GGCCCAGGCGGCCCTCGAGC

Total: 20 bp

(31) Sequence of primer Ap3f4-R (SEQ ID NO:32):

CTCCTCTAATACGACTCACTATAGGGACACTCACCTAGCCTCTG

Total: 44 bp

(32) Sequence of primer m4f3-R (SEQ ID NO:33):

CCTCGCAAGATCACGACAATC

Total: 21 bp

(33) Sequence of quantitative PCR probe for AP3 (SEQ ID NO:34):

CCATTTTCATCCTCAAGACGACGCAGCT

Total: 27 bp

(34) Sequence of quantitative PCR primer for AP3 (Forward) (SEQ ID NO:35):

TTTGACGAGCTTGACATTCAG

Total: 22 bp

(35) Sequence of quantitative PCR primer for AP3 (Reverse) (SEQ ID NO:36):

CGCGAACGAGTTTGAAAGTG

Total: 20 bp

(36) Sequence of 2C7-SID (Figure 3) (SEQ ID NO:66):

gacggatcgggagatctccgatccccctatggtcgactctcagtacaatctgctctgatgcccatagttaagccagta
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